MIC Series Power Supplies

MIC Series

BOSCH

en Installation Manual

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1 Safety

1.1 Important safety instructions

Read, follow, and retain for future reference all of the following safety instructions. Heed all warnings on the unit and in the operating instructions before operating the unit.

1. **Cleaning -** Unplug the unit from the outlet before cleaning. Follow any instructions provided with the unit. Generally, using a dry cloth for cleaning is sufficient, but a moist fluff-free cloth or leather shammy may also be used. Do not use liquid cleaners or aerosol cleaners.
2. **Heat Sources -** Do not install the unit near any heat sources such as radiators, heaters, stoves, or other equipment (including amplifiers) that produce heat.
3. **Water -** Do not use this unit near a bathtub, washbowl, or a sink.
4. **Object and liquid entry -** Never push objects of any kind into this unit through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electrical shock. Never spill liquid of any kind in the unit. Do not place objects filled with liquids, such as vases or cups, on the unit.
5. **Lightning -** For added protection during a lightning storm, or when leaving this unit unattended and unused for long periods, unplug the unit from the wall outlet and disconnect the cable system. This will prevent damage to the unit from lightning and power line surges.
6. **Controls adjustment -** Adjust only those controls specified in the operating instructions. Improper adjustment of other controls may cause damage to the unit. Use of controls or adjustments, or performance of procedures other than those specified, may result in hazardous radiation exposure.
7. **Overloading -** Do not overload outlets and extension cords. This can cause fire or electrical shock.

8. **Power supply cord and plug protection -** Protect the power supply cord and plug from foot traffic, being pinched by items placed upon or against them at electrical outlets, and its exit from the unit. For units intended to operate with 230 VAC, 50 Hz, the power supply cord must comply with the latest versions of *IEC 60227*. For units intended to operate with 120 VAC, 60 Hz, the power supply cord must comply with the latest versions of *UL 62* and *CSA 22.2 No.49*.
9. **Power disconnect -** Units have power supplied to the unit whenever the power cord is inserted into the power source. The power cord is the main power disconnect device for switching off the voltage for all units.
10. **Servicing -** Do not attempt to service this unit yourself. Opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.
11. **Damage requiring service -** Unplug the unit from the main AC power source and refer servicing to qualified service personnel when any damage to the equipment has occurred, such as:
    - the power supply cord or plug is damaged;
    - exposure to moisture, water, and/or inclement weather (rain, snow, etc.);
    - liquid has been spilled in or on the equipment;
    - an object has fallen into the unit;
    - unit has been dropped or the unit cabinet is damaged;
    - unit exhibits a distinct change in performance;
    - unit does not operate normally when the user correctly follows the operating instructions.
12. **Replacement parts -** Be sure the service technician uses replacement parts specified by the manufacturer, or that have the same characteristics as the original parts. Unauthorized substitutions may cause fire, electrical shock, or other hazards.

13. **Safety check -** Safety checks should be performed upon completion of service or repairs to the unit to ensure proper operating condition.
14. **Installation -** Install in accordance with the manufacturer's instructions and in accordance with applicable local codes.
15. **Attachments, changes or modifications -** Only use attachments/accessories specified by the manufacturer. Any change or modification of the equipment, not expressly approved by Bosch, could void the warranty or, in the case of an authorization agreement, authority to operate the equipment.

1.2 Safety precautions

DANGER!
High risk: This symbol indicates an imminently hazardous situation such as “Dangerous Voltage” inside the product. This symbol indicates the presence of non-insulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

WARNING!
Medium risk: Indicates a potentially hazardous situation.
If not avoided, this could result in minor or moderate bodily injury.

CAUTION!
Low risk: Indicates a potentially hazardous situation.
If not avoided, this could result in property damage or risk of damage to the unit.

1.3 Important notices

Accessories - Do not place this unit on an unstable stand, tripod, bracket, or mount. The unit may fall, causing serious injury and/or serious damage to the unit. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer. When a cart is used, use caution and care when moving the cart/apparatus combination to avoid injury from tip-over. Quick stops, excessive force, or uneven surfaces may cause the cart/unit combination to overturn. Mount the unit per the manufacturer's instructions.

All-pole power switch - Incorporate an all-pole power switch, with a contact separation of at least 3 mm in each pole, into the electrical installation of the building.If it is needed to open the housing for servicing and/or other activities, use this all-pole switch as the main disconnect device for switching off the voltage to the unit.

Coax grounding:

- Ground the cable system if connecting an outside cable system to the unit.
- Connect outdoor equipment to the unit's inputs only after this unit has had its grounding plug connected to a grounded outlet or its ground terminal is properly connected to a ground source.
- Disconnect the unit's input connectors from outdoor equipment before disconnecting the grounding plug or grounding terminal.
- Follow proper safety precautions such as grounding for any outdoor device connected to this unit.

U.S.A. models only - *Section 810* of the *National Electrical Code, ANSI/NFPA No.70*, provides information regarding proper grounding of the mount and supporting structure, grounding of the coax to a discharge unit, size of grounding conductors, location of discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

Disposal - Your Bosch product was developed and manufactured with high-quality material and components that can be recycled and reused. This symbol means that electronic and electrical appliances, which have reached the end of their working life, must be collected and disposed of separately from household waste material. Separate collecting systems are usually in place for disused electronic and electrical products. Please dispose of these units at an environmentally compatible recycling facility, per *European Directive 2002/96/EC*.

Environmental statement - Bosch has a strong commitment towards the environment. This unit has been designed to respect the environment as much as possible.

Electrostatic-sensitive device - Use proper CMOS/MOS-FET handling precautions to avoid electrostatic discharge.
NOTE: Wear required grounded wrist straps and observe proper ESD safety precautions when handling the electrostatic-sensitive printed circuit boards.

Fuse rating - For security protection of the device, the branch circuit protection must be secured with a maximum fuse rating of 16A. This must be in accordance with *NEC800 (CEC Section 60)*.

Grounding and polarization - This unit may be equipped with a polarized alternating current line plug (a plug with one blade wider than the other blade). This safety feature allows the plug to fit into the power outlet in only one way. If unable to insert the plug fully into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the polarized plug.
Alternately, this unit may be equipped with a 3-pole grounding plug (a plug with a third pin for earth grounding). This safety feature allows the plug to fit into a grounded power outlet only. If unable to insert the plug into the outlet, contact a locally certified electrician to replace the obsolete outlet. Do not defeat the safety purpose of the grounding plug.

Moving - Disconnect the power before moving the unit. Move the unit with care. Excessive force or shock may damage the unit and the hard disk drives.

Outdoor signals - The installation for outdoor signals, especially regarding clearance from power and lightning conductors and transient protection, must be in accordance with *NEC725* and *NEC800 (CEC Rule 16-224* and *CEC Section 60)*.

Permanently connected equipment - Incorporate a readily accessible disconnect device in the building installation wiring.

Pluggable equipment - Install the socket outlet near the equipment so it is easily accessible.

Power resupply - If the unit is forced to power down due to exceeding the specified operating temperatures, disconnect the power cord, wait for at least 30 seconds, and then reconnect the power cord.

Power lines - Do not locate the camera near overhead power lines, power circuits, or electrical lights, nor where it may contact such power lines, circuits, or lights.

Rack-mount

– Ventilation - Do not place this unit in a built-in installation or rack without proper ventilation or adhering to the manufacturer's instructions. The equipment must not exceed its maximum operating temperature requirements.
– Mechanical loading - Properly mount the equipment in a rack to prevent a hazardous condition due to uneven mechanical loading.

CAUTION!
Connecting System ground to Safety ground may result in ground loops that can disrupt the CCTV system.

Video loss - Video loss is inherent to digital video recording; therefore, Bosch Security Systems cannot be held liable for any damage that results from missing video information. To minimize the risk of lost digital information, Bosch Security Systems recommends multiple, redundant recording systems, and a procedure to back up all analog and digital information.

NOTICE!
This is a class B product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

FCC & ICES Information

This equipment has been tested and found to comply with the limits for a **Class B** digital device, pursuant to *part 15* of the *FCC Rules*. These limits are designed to provide reasonable protection against harmful interference in a **residential installation**. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- reorient or relocate the receiving antenna;
- increase the separation between the equipment and receiver;
- connect the equipment into an outlet on a circuit different from that to which the receiver is connected;
- consult the dealer or an experienced radio/TV technician for help.

Intentional or unintentional modifications, not expressly approved by the party responsible for compliance, shall not be made. Any such modifications could void the user's authority to operate the equipment. If necessary, the user should consult the dealer or an experienced radio/television technician for corrective action.

The user may find the following booklet, prepared by the Federal Communications Commission, helpful: *How to Identify and Resolve Radio-TV Interference Problems*. This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

INFORMATIONS FCC ET ICES

Suite à différents tests, cet appareil s'est révélé conforme aux exigences imposées aux appareils numériques de **classe B**, en vertu de la *section 15 du règlement* de la *Commission fédérale des communications des États-Unis (FCC)*, et en vertu de la norme *ICES-003 d'Industrie Canada*. Ces exigences visent à fournir une protection raisonnable contre les interférences nuisibles lorsque l'appareil est utilisé dans le cadre d'une **installation résidentielle**. Cet appareil génère, utilise et émet de l'énergie de radiofréquences et peut, en cas d'installation ou d'utilisation non conforme aux instructions, engendrer des interférences nuisibles au niveau des radiocommunications. Toutefois, rien ne garantit l'absence d'interférences dans une installation particulière. Il est possible de déterminer la production d'interférences en mettant l'appareil successivement hors et sous tension, tout en contrôlant la réception radio ou télévision. L'utilisateur peut parvenir à éliminer les interférences éventuelles en prenant une ou plusieurs des mesures suivantes:

- Modifier l'orientation ou l'emplacement de l'antenne réceptrice;
- Éloigner l'appareil du récepteur;
- Brancher l'appareil sur une prise située sur un circuit différent de celui du récepteur;
- Consulter le revendeur ou un technicien qualifié en radio/ télévision pour obtenir de l'aide.

Toute modification apportée au produit, non expressément approuvée par la partie responsable de l'appareil, est strictement interdite. Une telle modification est susceptible d'entraîner la révocation du droit d'utilisation de l'appareil.
La brochure suivante, publiée par la Commission fédérale des communications (FCC), peut s'avérer utile : *How to Identify and Resolve Radio-TV Interference Problems (Comment identifier et résoudre les problèmes d'interférences de radio et de télévision)*. Cette brochure est disponible auprès du U.S. Government Printing Office, Washington, DC 20402, États-Unis, sous la référence n° 004-000-00345-4.

Disclaimer

Underwriter Laboratories Inc. (“UL”) has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Closed Circuit Television Equipment, UL 2044*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.
UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING RELATED FUNCTIONS OF THIS PRODUCT.

Disclaimer

Underwriter Laboratories Inc. (“UL”) has not tested the performance or reliability of the security or signaling aspects of this product. UL has only tested fire, shock and/or casualty hazards as outlined in UL's *Standard(s) for Safety for Information Technology Equipment, UL 60950-1*. UL Certification does not cover the performance or reliability of the security or signaling aspects of this product.
UL MAKES NO REPRESENTATIONS, WARRANTIES, OR CERTIFICATIONS WHATSOEVER REGARDING THE PERFORMANCE OR RELIABILITY OF ANY SECURITY OR SIGNALING-RELATED FUNCTIONS OF THIS PRODUCT.

Notice of Regulatory Compliance

This product complies with the following EC directives:
- EMC Directive (89/336/EC as amended)
- LV Directive (73/23/EC)
- RoHS (Restriction of Hazardous Substances) 2002/95/ ECEMC, CISPRA-B and CTIC

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More information

For additional information, please contact the Bosch Security Systems location nearest you or visit our web site at www.boschsecurity.com

1.4 Customer Support and Service

If this unit needs service, contact the nearest Bosch Security Systems Service Center for authorization to return and shipping instructions.

Service Centers

USA

Repair Center-
Telephone: 800-566-2283
Fax: 800-366-1329
E-mail: repair@us.bosch.com

Customer Service
Telephone: 888-289-0096
Fax: 585-223-9180
E-mail: security.sales@us.bosch.com

Technical Support
Telephone: 800-326-1450
Fax: 585-223-3508 or 717-735-6560
E-mail: technical.support@us.bosch.com

Canada
Telephone: 514-738-2434
Fax: 514-738-8480

Europe, Middle East, Africa Region

Repair Center
Telephone: 31 (0) 76-5721500
Fax: 31 (0) 76-5721413
E-mail: RMADesk.STService@nl.bosch.com

Asia Region

Repair Center
Telephone: 65 63522776
Fax: 65 63521776
E-mail: rmahelpdesk@sg.bosch.com

Customer Service
Telephone: 86 (0) 756 7633117 or
86 (0) 756 7633121
Fax: 86 (0) 756 7631710
E-mail: customer.service@cn.bosch.com

Warranty and more information

For additional information and warranty queries, please contact your Bosch Security Systems representative or visit our website at www.boschsecurity.com.

2 Introduction

The MIC Series power supplies from Bosch Security Systems, Inc. provide all connections for power, telemetry and video for the MIC Series range of PTZ cameras. Each power supply has CE and FCC approval and is rated to IP65. The following table summarizes the power supplies and their functions:

MIC-240PSU-UL	240 VAC MIC Power Supply
MIC-IR-240PSU-UL	240 VAC MIC IR only Power Supply
MIC-115PSU-UL	115 VAC MIC Power Supply
MIC-IR-115PSU-UL	115 VAC MIC IR only Power Supply
MIC-24PSU-UL	24 VAC MIC Power Supply
MIC-IR-24PSU-UL	24 VAC MIC IR only Power Supply

NOTICE!
Use the MIC-2M-S, MIC-10M-S, MIC-20M-S and MIC-25M-S Shielded Composite Cables with the MIC power supplies for correct EMC protection.

2.1 Parts List

Each power supply is contained within a cast aluminium enclosure and comes with the following:

- A weather resistant (IP65) cast aluminium box pre-fitted with three (3) cable glands.
- A power supply for a MIC Series camera.
- Provision for driving various interface cards mounted internally to the power supply box, for example an alarm interface card (Non-IR power supplies only).
- Provision for a signal interface card (BP-3 or BP-4) to connect telemetry to Bosch Biphase equipment.
- Screw termination of all composite, telemetry and ancillary cables in the box.
- Earth isolation and termination within the unit to correctly control video earthing and to prevent earth loop.

- Three (3) M12 cable glands for telemetry, video and ancillary equipment.
- One (1) M16 gland for connection of the screened composite cable to the MIC camera.
- One (1) 1/2 in. NPT cable gland for the power cable connection.
- One (1) 1/2 in. NPT and one (1) M12 blanking plug.

2.2 Preparing the Power Supply Unit

- Remove the blanking plug that covers the hole for the power cable and attach the supplied 1/2 in. NPT cable gland for the power cable depending upon the installation requirements.
- Remove the second blanking plug that covers one of the holes for an M12 cable gland and attach the supplied M12 gland fitted in its place if additional cabling for ancillary equipment such as alarms or a washer pump is required.

CAUTION!

The PSU enclosures are not EXD rated and must be replaced with a certified enclosure if installed within a hazardous area. Please see the *MIC Series EXD 440 Camera* manual for further details.

2.3 Securing the Power Supply Unit

Secure the power supply unit using four (4) M6 screws or bolts (not supplied); which secure through the holes in the enclosure as shown In the figure below.

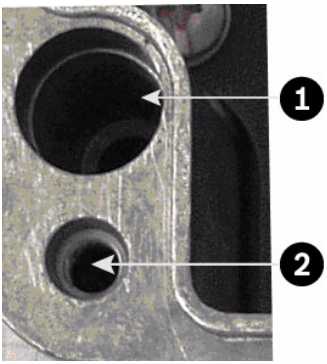


Figure 2.1 Enclosure mounting and enclosure lid screw holes

1	Enclosure mounting screw
2	Enclosure lid screw hole

2.4 IP Rating

The power supply enclosure is an IP65 weather-resistant cast aluminium enclosure. To maintain the environmental rating of this enclosure, install only listed or recognized conduit hubs or fittings with the same environmental rating as the enclosure in compliance with the installation instruction of the hub or fitting.

2.5 MIC Shielded Composite Cable Gland Connection

The MIC power supplies are designed to use the MIC shielded composite cable. Fit this cable into the M16 nickel plated brass cable gland as detailed below. It is important that the braided cable screen engages with the internal clamps of the cable gland to ensure correct EMC protection.

1. Strip the cable jacket back, leaving 25 mm of braided shield; then fold the braided shield back over the cable jacket.
2. Insert the shielded composite cable into the cable gland until the braided shield reaches the internal clamp position (approximately 20 mm inside gland)
3. Tighten the dome nut with a wrench to ensure the nut is fully tightened and securely grips the cable and braided shield as shown below.

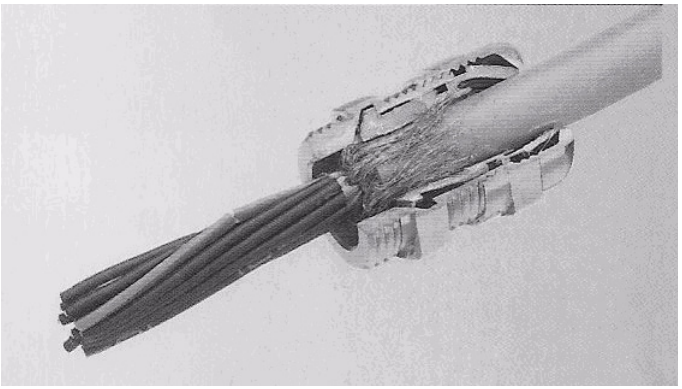


Figure 2.2 Composite cable gland connection

3 MIC Non-IR Power Supply Units

Use this chapter to install the following MIC power supply units:

- MIC-240PSU-UL
- MIC-115PSU-UL
- MIC-24PSU-UL

The MIC power supplies provide power, telemetry and video connections for a single MIC camera appropriate for the power supply type.

All non-IR MIC power supplies have the same layout and wiring procedure; only the input voltages and fusing vary between the 230 VAC, 115 VAC and the 24 VAC power supplies.

DANGER! ELECTRICAL SHOCK HAZARD

Ensure the power is disconnected prior to opening the power supply enclosure.

Power must be disconnected before replacing any fuse in the MIC PSU.

The MIC power supplies have a separate internal shield covering the power cable input head-end (HD1).

Only suitably qualified persons should remove this shield and connect the mains power cable, the shield MUST be re-fitted and fully secured prior to connecting the power.

The mains supply cable shall have conductors of a maximum size of 12 AWG.

A readily accessible disconnect device (circuit breaker) shall be incorporated externally to the equipment. The recommended rating is 15 A.

3.1 Printed Circuit Board Earth Link

The Printed Circuit Board (PCB) has one link option next to the add-on card slot, shown in *Figure 3.1* below, allowing the power supply to be set up for different earthing schemes.

The earth link should be broken if there is a separate connection between the video screen and the earth. This usually occurs on copper connected systems where all the copper video coaxial cables are taken back to the control room

to be connected to a central earth point. If fiber optics or other indirect connections are used to get data and video to and from the control room then the earth link should be left intact provided it is the only camera end earth reference point.

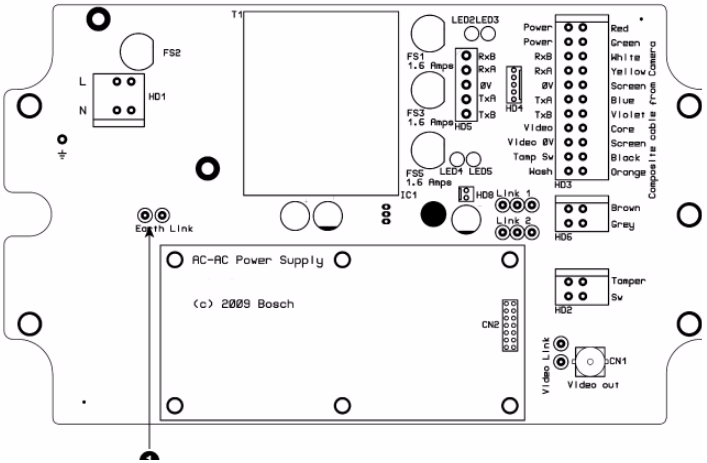


Figure 3.1 Position of earth link

3.2 Non-IR Power Supply Layout and Connections

The following figure shows the power supply PCB connections:

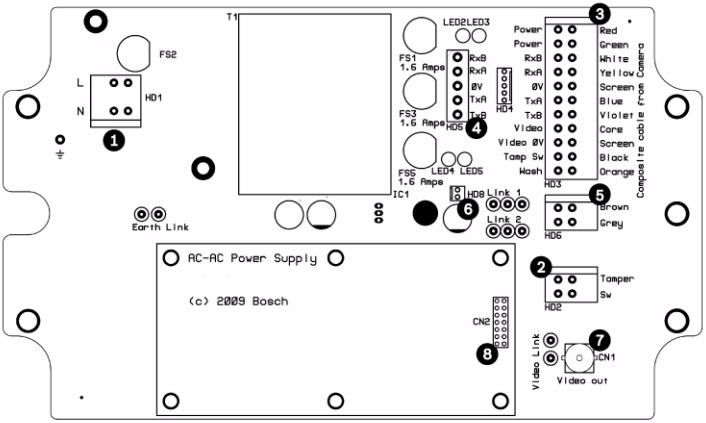


Figure 3.2 MIC-240PSU-UL layout

Item	PSU Head-end	Head-end Description	Head-end Terminal
1	HD1	Power cable head-end	Screw terminal
2	HD2	Tamper switch head-end	Screw terminal
3	HD3	Composite cable head-end	Screw terminal
4	HD4 and HD5	Telemetry head-ends	Screw terminal or Molex crimp
5	HD6	Heater head-end	Screw terminal
6	HD8	Optional 516 Kbd power head-end	Molex crimp
7	CN1	Coax Video head-end	BNC crimp
8	CN2/3	Auxiliary card head-end	Plug in

CAUTION!

Do not Connect MIC PA or MIC IR units to a MIC-PSU with the heater option enabled as this can result in damage to the cameras. Ensure that the heater link is disabled if a MIC PA is used and ensure an IR power supply is used with a MIC IR camera unit.

3.3 Fuse Ratings

CAUTION!
Replace with only the same type and rating of the fuse for continued protection against the risk of fire, damage or injury.

The power supply houses four (4) off 20 mm fuses in fuse holders. The ratings for these fuses are fixed on the low voltage secondary side but changes with the input voltage on the high voltage primary side.
The following table shows the fuse values that should be fitted to provide proper protection for the MIC-240PSU-UL, MIC-115PSU-UL and the MIC-24PSU-UL Non-IR power supplies.
Note: Fuse FS4 does not exist.

Fuse	Function	Ratings for 240 V Primary	Ratings for 115 V Primary	Ratings for 24 V Primary
FS1	MIC protection	1.6 A glass anti-surge (T)	1.6 A glass anti-surge (T)	1.6 A glass anti-surge (T)
FS2	Primary protection	500 mA quick blow	800 mA quick blow	2.5 A ceramic quick blow
FS3	Heater protection 1	1.6 A glass anti-surge (T)	1.6 A glass anti-surge (T)	1.6 A glass anti-surge (T)
FS5	Heater protection 2	1.6 A glass anti-surge (T)	1.6 A glass anti-surge (T)	1.6 A glass anti-surge (T)

WARNING!
Fitting fuses other than the values described above invalidates the product warranty and may result in damage to the product or injury to the installer.

3.4 Installing a Non-IR Power Supply

DANGER! ELECTRICAL SHOCK HAZARD
Ensure the power is disconnected prior to opening the power supply enclosure.
Power must be disconnected before replacing any fuse in the MIC PSU.
The MIC power supplies have a separate internal shield covering the power cable input head-end (HD1).
Only suitably qualified persons should remove this shield and connect the mains power cable, the shield MUST be re-fitted and fully secured prior to connecting the power.
The mains supply cable shall have conductors of a maximum size of 12 AWG.
A readily accessible disconnect device (circuit breaker) shall be incorporated externally to the equipment. The recommended rating is 15 A.

1. Locate the mounting position of the MIC-PSU so that it cannot be interfered with either intentionally or accidentally, a lockable cabinet is recommended.
2. Securely fix the power supply enclosure using M6 screws (not supplied); ensure the cable glands have sufficient room to allow for the cables to enter approximately 60 mm on either side of the enclosure.
3. Open the power supply enclosure and undo the M3 screws on the internal shield and retain these; then remove the internal shield covering the mains cable head-end HD1. Removing this shield also gives access to the blanking plug to allow a suitable conduit or the cable gland to be fitted.

Figure 3.3 High voltage input head-end shield fitted inside the PSU enclosure

4. If using a conduit for the power cord, remove the blanking plug and install a suitable conduit in its place. Secure as recommended by the conduit manufacturer.
5. If using a power cord without a conduit, remove the blanking plug and fit the 1/2-in. NPT cable gland instead as depicted below. Please note it is easier to fit the cord through the gland outside of the enclosure then attach the cable gland to the enclosure.

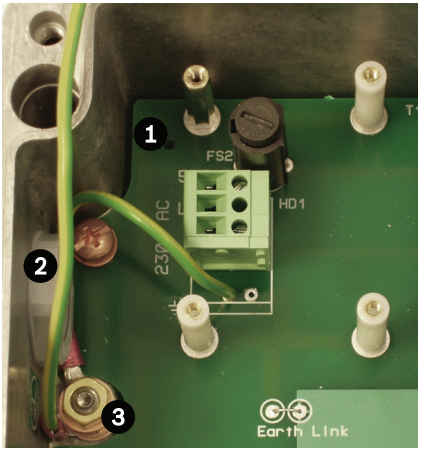


Figure 3.4 Mains input head-end with shield removed showing HD1 terminal and cable gland fitted

1	Earth core to power supply PCB
2	Earth core to enclosure lid
3	Earth post

6. Carefully connect the Live and Neutral cores to the correct HD1 screw terminals as shown below and also printed on the PCB (next to the connector and not visible in the image above).

PCB Marking	Terminal Identification
Live	HD1-L
Neutral	HD1-N

7. Crimp a 6 mm ring terminal (supplied) to the earth core on the power cord using copper washers. Securely bolt this to the earth termination post with the lid and PCB earth wires as shown below. Tighten the cable gland to secure and seal the power cord.

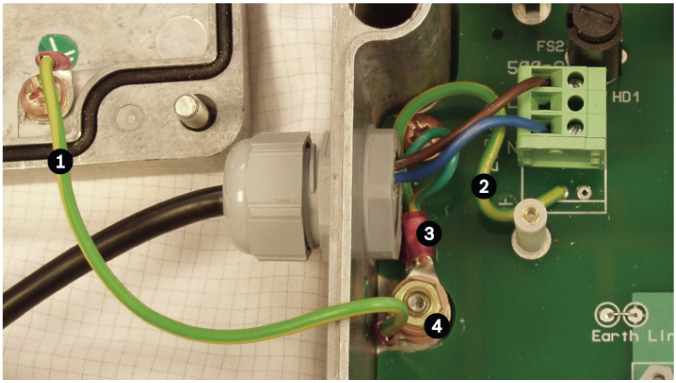


Figure 3.5 Mains cable wired into HD1 showing earth terminal connections

1	Enclosure lid earth cable
2	Earth core from power supply PCB
3	Earth core from Mains cord
4	Enclosure earth termination post

8. Reattach the mains head-end shield taking care to avoid pinching the cables and securely screw down as shown in *Figure 3.3*.
9. Feed the shielded composite cable through the metal M16 gland; then connect the shielded composite cable to the screw terminal head-end HD3 as shown below and printed on the PCB. When completed tighten the cable gland to firmly grip the shielded cable.

Composite Cable Wire Color	Function	MIC PSU Terminal Block	PCB Marking
Red	AC supply	HD3-1	Power
Green	AC supply return	HD3-2	Power
White	RX +	HD3-3	RxB
Yellow	Rx -	HD3-4	RxA
Drain Wire	Ground	HD3-5	GND
Blue	Tx -	HD3-6	TxA
Violet	Tx +	HD3-7	TxB
Coax Core	Video	HD3-8	Video
Coax Screen	Video return	HD3-9	Vid 0V
Black (optional)	Tamper switch	HD3-10	Tamp Sw
Orange (optional)	Wash drive	HD3-11	Wash

NOTICE!

The earth core 6 mm ring crimp should be a Tyco Electronics, 0-0321045-0, PIDG, M6, BLUE, UL certification CCN ZMVV, file E13288. A suitable ring crimp tool for fitting the ring crimp is a Davico type DHCR15 or equivalents.

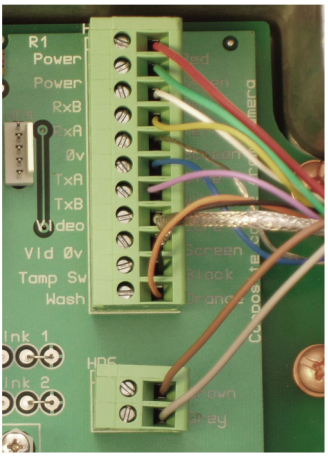


Figure 3.6 Shielded composite cable connected to HD3

10. Connect a tamper switch relay to HD2, if necessary.
11. Feed the coax cable through the cable gland and crimp the end with a BNC connector then connect the coax video cable to the CN1 head-end.

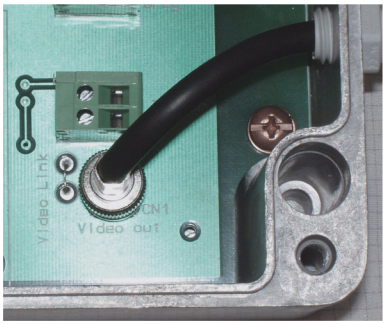


Figure 3.7 Coaxial video connection

12. Use CN2 for additional add-on cards such as the 8-input alarm card or the Biphase card.
13. Crimp or screw telemetry connections to head-ends HD4 and HD5 to connect the MIC camera to the control room as shown below.

Telemetry Signal Name	HD3	HD4	HD5
RxB or Rx -	Pin 3	Pin 1	Pin 1
RxA or Rx +	Pin 4	Pin 2	Pin 2
GND	Pin 5	Pin 3	Pin 3
TxA or Tx -	Pin 6	Pin 4	Pin 4
TxB or Tx +	Pin 7	Pin 5	Pin 5

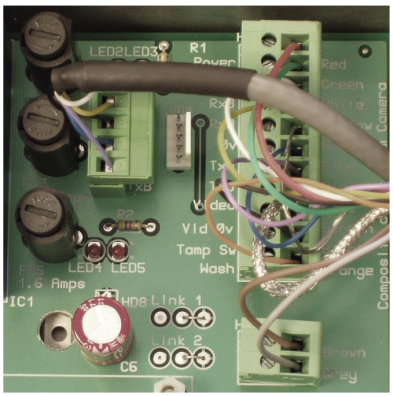


Figure 3.8 Telemetry connections from HD5

14. When wiring is complete, apply power and check the all four (4) LEDs are lit.
    - LED1 – 18 VAC power on to camera
    - LED2 – 18 VAC power on to camera
    - LED4 – Power on for optional heater
    - LED5 – Power on for optional heater
15. Re-attach the enclosure lid and screw it down until tight.
16. For installation of the MIC-WKT-KIT, MIC-ALM or MIC-BP-4 Biphase card please refer to the respective manuals.

3.5 Optional Cards and Kits for Non-IR MIC Cameras

The MIC power supplies have several optional cards and kits. Please refer to the respective manuals for details on their installation and operation.

MIC-WKT	Washer bracket, nozzle and pump card kit for non-IR cameras.
MIC-ALM	8-input alarm card for non-IR cameras, includes washer pump drive function.
MIC-BP3	Bosch Biphase converter card for MIC-power supplies without an expansion slot available including all IR power supplies.
MIC-BP4	Bosch Biphase converter card for MIC power supplies with an available expansion slot.

3.6 Commissioning a MIC Series Camera with Public Address Speakers

The MIC Series Public Address camera has two (2) 6 W, 8 Ohm, IP67 rated speakers connected in series to allow for public address (PA) applications. These use the brown and gray wires on the composite cable that are normally used for IR illuminators or heaters.

There is no connection terminal for speakers on the power supply itself; connect the speakers directly to a third party amplifier and microphone using a chock block (not supplied). To use the speakers please do the following:

1. Disconnect the power supply from the power source; locate the brown and gray wires in the shielded composite cable.
2. Using a terminal block (not supplied) connect the brown and gray wires from the speakers.
3. Feed the speaker cable through one of the conduit glands in the power supply unit enclosure.
4. Connect the speaker cable from a third party amplifier and microphone.

3.7 Commissioning a MIC Series Camera with Heater Option

These instructions are applicable to the MIC non-IR power supplies only.

There are two links on the power supply printed circuit board which must be changed to allow heater operation.

Please do the following to enable the heaters to function:

1. Disconnect the power supply from the power source.
2. Locate the PCB links next to HD6 (item 1, below), the default setting is 0 V.

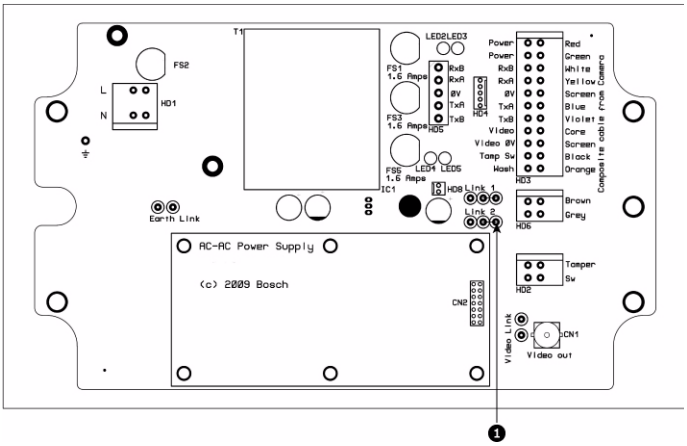


Figure 3.9 Heater link set to 0 V (default)

3. Break the two wire links and remove any excess solder.
4. Solder the wire links using a soldering iron and TCW link wire from the left hand pads to the middle pads.

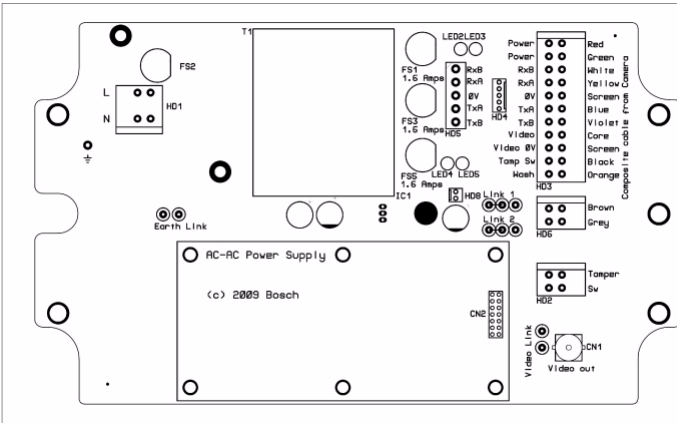


Figure 3.10 Heater link set to +18 V

5. The power supply will now deliver +18 VAC to head-end HD6.

Composite Cable Wire Color	Function	MIC PSU Terminal Block
Brown	Heater[1] or IR Lamps[2]	HD6-1
Gray	Heater[1] or IR Lamps[2]	HD6-2

1. See *Section 3.7 Commissioning a MIC Series Camera with Heater Option, page 30*, for details on commissioning MIC cameras with the heater option fitted.
2. IR power supplies only; see *Section 4 MIC IR Power Supply Units, page 32*, for more details.

6. Connect the heater wires (brown and gray) from the shielded composite cable to the HD6 termination head-end as labelled on the PCB.
7. The heaters are thermostatically controlled and will automatically turn on at +5°C (+41°F) and turn off at +15°C (+59°F).
8. Check all connections, reseal the PSU enclosure and reapply power.

4 MIC IR Power Supply Units

Use this chapter to install the following MIC power supply units:

- MIC-IR-240PSU-UL
- MIC-IR-115PSU-UL
- MIC-IR-24PSU-UL

The power supplies for the MIC Series IR cameras are available in 230/115 VAC source and 24 VAC source versions.

DANGER! ELECTRICAL SHOCK HAZARD
Ensure the power is disconnected prior to opening the power supply enclosure.
Power must be disconnected before replacing any fuse in the MIC PSU.
The MIC power supplies have a separate internal shield covering the power cable input head-end (HD1).
Only suitably qualified persons should remove this shield and connect the mains power cable, the shield MUST be re-fitted and fully secured prior to connecting the power.
The mains supply cable shall have conductors of a maximum size of 12 AWG.
A readily accessible disconnect device (circuit breaker) shall be incorporated externally to the equipment. The recommended rating is 15 A.

These power supplies have a second isolated power supply for driving the IR illuminators. The operation of this power supply is controlled by the camera itself via telemetry commands received from the control room. The power supply operates the twin illuminators using a constant current drive which automatically configures itself for IR lamp operation. There are no adjustable items within the power supply except for the earth link discussed below.
The power supply also provides a circuit for operating a 24 VAC or VDC washer pump and has four (4) volt-free alarm contact inputs which activate presets within the camera but always notifies the control system of the status of these alarms. The

HD2 head-end provides the option for connection up to four (4) alarm inputs to the power supply. These can be tamper switches or inputs from other sensors or switches.
Earth isolation and termination within the unit provides correct control of video earthing and thus prevents earth loops.

WARNING!
The washer pump relay is rated only to 24 VAC or VDC maximum voltage and is not suitable for Mains operated pumps.

4.1 Printed Circuit Board Earth Link

The Printed Circuit Board (PCB) has one link option just below the Mains head-end cover plate, as shown below, allowing the power supply to be set up for different earthing schemes.

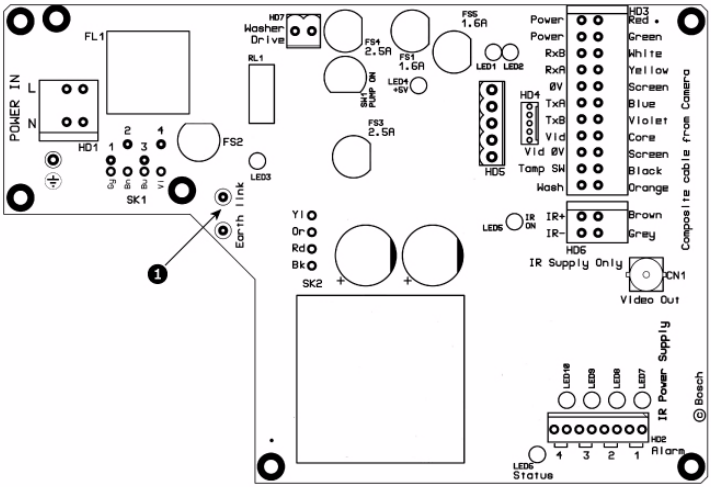


Figure 4.1 IR PSU earth link

The earth link (item 1, above) should be broken if there is a separate connection between the video screen and the earth. This usually occurs on copper connected systems where all the copper video coaxes are taken back to the control room to be connected to a central earth point. If fiber optics or other indirect connections are used to get data and video to and from the control room then the earth link should be left intact provided it is the only camera end earth reference point.

4.2 Fuse Ratings

CAUTION!
Replace with only the same type and rating of the fuse for continued protection against the risk of fire, damage or injury.

There are five (5) 20 mm fuses fitted to the power supply with the following functions:

Fuse	Function	Type	Ratings for 240 V Primary	Ratings for 115 V Primary	Ratings for 24 V Primary
FS1	18 VAC secondary fuse. MIC supply	Glass	1.6 A quick blow	1.6 A quick blow	1.6 A quick blow
FS2	Mains input fuse for transformer	Ceramic	600 mA quick blow	1.0 A quick blow	2.5 A quick blow
FS3	IR lamp supply fuse	Glass	2.5 A quick blow	2.5 A quick blow	2.5 A quick blow
FS4	Fuse for washer drive	Ceramic	2.5 A quick blow	2.5 A quick blow	2.5 A quick blow
FS5	18 VAC secondary fuse. MIC supply	Glass	1.6 A quick blow	1.6 A quick blow	1.6 A quick blow

WARNING!
Fitting fuses other than the values described above invalidates the product warranty and may result in damage to the product or injury to the installer.

4.3 MIC IR Power Supply Layout and Connections

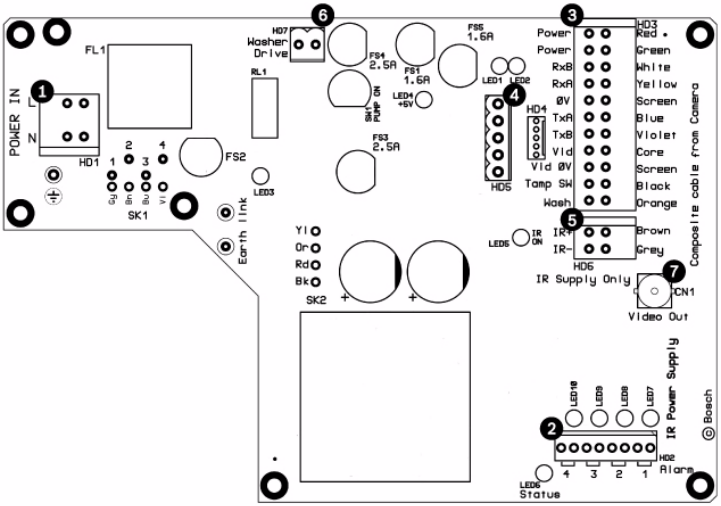


Figure 4.2 MIC-IR-240PSU layout

Item	PSU Head-end	Head-end Description	Head-end Terminal
1	HD1	Power cable head-end	Screw terminal
2	HD2	4-input alarm head-end	Screw terminal
3	HD3	Composite cable head-end	Screw terminal
4	HD4 and HD5	Telemetry head-ends	Screw terminal or Molex crimp
5	HD6	IR lamps head-end	Screw terminal
6	HD7	Washer drive head-end	Molex crimp
7	CN1	Coax Video head-end	BNC crimp

4.4 Installing a MIC IR Power Supply

DANGER! ELECTRICAL SHOCK HAZARD
Ensure the power is disconnected prior to opening the power supply enclosure.
Power must be disconnected before replacing any fuse in the MIC PSU.
The MIC power supplies have a separate internal shield covering the power cable input head-end (HD1).
Only suitably qualified persons should remove this shield and connect the mains power cable, the shield MUST be re-fitted and fully secured prior to connecting the power.
The mains supply cable shall have conductors of a maximum size of 12 AWG.
A readily accessible disconnect device (circuit breaker) shall be incorporated externally to the equipment. The recommended rating is 15 A.

To install the MIC-IR-240PSU, MIC-IR-115PSU and MIC-IR-24PSU do the following:

1. Locate the mounting position of the MIC-PSU so that it cannot be interfered with either intentionally or accidentally, a lockable cabinet is recommended.
2. Securely fix the MIC-PSU using M6 screws and washers (not supplied). Ensure the cable glands have sufficient room, approximately 60 mm, to allow for the cables to enter.
3. Open the power supply enclosure and undo the M3 screws on the internal shield and retain these; then remove the internal shield covering the mains cable head-end HD1. removing this shield also gives access to the blanking plug to allow a suitable conduit or the cable gland to be fitted.

Figure 4.3 High voltage input head-end shield fitted inside the PSU enclosure

4. If using a conduit for the power cord, remove the blanking plug and install a suitable conduit in its place, secure as recommended by the conduit manufacturer.
5. If using a power cord without a conduit, remove the blanking plug and fit the 1/2-in. NPT cable gland instead. Note it is easier to fit the cable through the gland outside of the enclosure then attach the cable gland to the enclosure.
6. Connect the power cord to HD1 carefully observing the polarity as shown below.

PCB Marking	Terminal Identification
Live	HD1-L
Neutral	HD1-N

7. Crimp a 6 mm ring terminal (supplied) to the earth core on the power cord using copper washers. Securely bolt this to the earth termination post with the Lid and PCB earth wires as shown below. Tighten the cable gland to secure and seal the power cable.

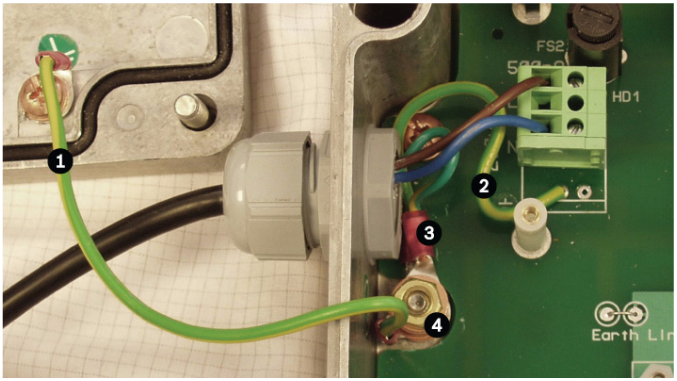


Figure 4.4 Mains cable wired into HD1 showing earth terminal connections

1	Enclosure lid earth cable
2	Earth core from power supply PCB
3	Earth core from Mains cable
4	Enclosure earth termination post

8. Feed the remaining video and telemetry cables through the appropriate sized glands.
9. Connect the composite cable to HD3 following the color coding as shown below:

Composite Cable Wire Color	Function	MIC PSU Terminal Block	PCB Marking
Red	AC supply	HD3-1	Power
Green	AC supply return	HD3-2	Power
White	RX +	Hd3-3	RxB
Yellow	Rx -	HD3-4	RxA
Drain Wire	Ground	HD3-5	GND
Blue	Tx -	HD3-6	TxA
Violet	Tx +	HD3-7	TxB
Coax Core	Video	HD3-8	Video
Coax Screen	Video return	HD3-9	Vid 0V
Black (optional)	Tamper switch	HD3-10	Tamp Sw
Orange (optional)	Wash drive	HD3-11	Wash

NOTICE!

The earth core 6 mm ring crimp should be a Tyco Electronics, 0-0321045-0, PIDG, M6, BLUE, UL certification CCN ZMVV, file E13288. A suitable ring crimp tool for fitting the ring crimp is a Davico type DHCR15 or equivalents.

10. Connect the brown and gray wires for the IR lamps to HD6.

Composite Cable Wire Color	Function	Terminal head-end	PCB Marking
Brown	IR Lamp +	HD6-1	IR+
Gray	IR Lamp -	HD6-2	IR-

11. Connect the coaxial video cable to the CN1 head-end.

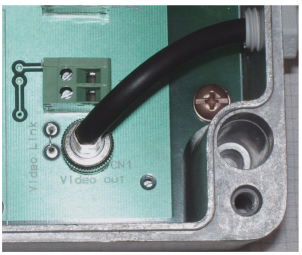


Figure 4.5 Coaxial video connection

12. Connect alarm input cables to HD2, as shown below, if necessary.

Connection	Function
HD2 pin 1	Alarm 1
HD2 pin 2	0 V
HD2 pin 3	Alarm 2
HD2 pin 4	0 V
HD2 pin 5	Alarm 3
HD2 pin 6	0 V
HD2 pin 7	Alarm 4
HD2 pin 8	0 V

13. Crimp or screw telemetry connections to head-ends HD4 and HD5 to connect the MIC camera to the control room as shown below.

Telemetry Signal Name	HD3	HD4	HD5
RxB or Rx -	Pin 3	Pin 1	Pin 1
RxA or Rx +	Pin 4	Pin 2	Pin 2
GND	Pin 5	Pin 3	Pin 3
TxA or Tx -	Pin 6	Pin 4	Pin 4
TxB or Tx +	Pin 7	Pin 5	Pin 5

14. A washer drive is provided as standard on the IR power supplies. A 24 VAC rated relay is fitted via the on board fuse F S4 (rated at 2 Amps). Connection to a third party washer pump system should be made via HD7.

Signal	Connection	PCB Marking
Washer Pump Live	HD7 pin 1	1
Washer Pump Neutral	HD 7 pin 2	2

15. Test the washer by pressing the red SW1 button.
    LED 3 illuminates in response to telemetry commands to switch the washer on from the control room. Note that the software in the camera prevents the washer from running more than 10 seconds continuously to prevent emptying the washer bottle.
16. When wiring is complete, apply power and check that all LEDs, except LED 5, are lit. The LEDs indicate the following:

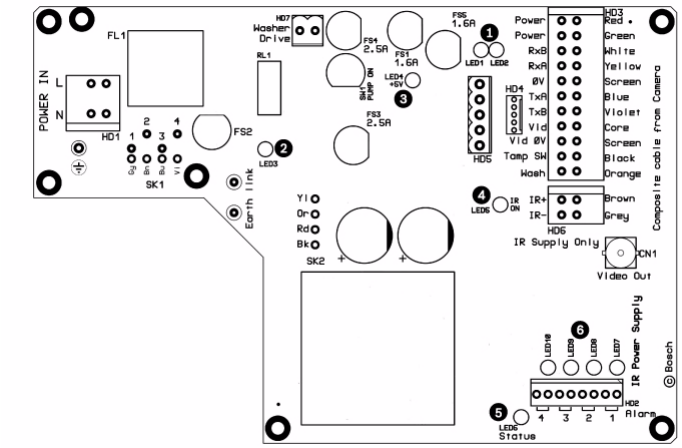


Figure 4.6 MIC Series IR power supply LED positions

1	LED 1 and LED 2	Indicates that 18 VAC is available from the power supply and that the supply fuses are intact. There is no indication of the operation of the telemetry lines as this would increase the load on these lines reducing the number of cameras that can be driven by a single telemetry spur.
2	LED 3	Illuminates when the washer drive relay is on.
3	LED 4	Monitors the internally generated +5 V rail used to drive the alarm interface circuits around HD2. This +5 V supply is not available externally.
4	LED 5	Illuminates when the IR lamp supply is turned on by the camera telemetry.
5	LED 6	Status LED. Pulses On/Off when Multi Alarm is selected.
6	LEDs 7-10	These LEDs illuminate when the associated alarm is active.

17. When satisfied the PSU is functioning correctly, re-attach the enclosure lid and screw down until tight.

4.5 Commissioning the IR Lamps

The following instructions apply to all MIC IR cameras. Connect a camera to a PC via RS422/485 telemetry and to the MIC Series Universal Camera Setup Software (see the *MIC Series Universal Camera Setup Software* Manual for further details), before applying power to the power supply, check that all connections are correct.

Apply power to the unit and ensure that LEDs 1 and 2, at the top of the PCB, and LED 4 are on (refer to *Figure 4.6*). This confirms that fuses FS1, 2, 3, and 5 are intact.

Check that the MIC is generating a video picture.

Once connected, set the current camera address in the MIC Series Universal Camera Setup Software and check that the camera can be moved using the pan, tilt and stop buttons.

The IR lamps selection is enabled by entering the Setups tab and setting the Multi Alarm mode on. LED 6 (refer to *Figure 4.6*), called STATUS starts flashing indicating correct operation. Activating the IR Lamps command in the MIC Series Universal Camera Setup Software (Cam-set) activates the twin IR lamps and illuminates LED 5.

IR lamps can be controlled either manually, automatically when the light level drops, or by using an external photocell connected to Alarm Input 4. These modes can be selected through Cam-set.

Please see the appropriate camera installation manual or the *MIC Series Universal Camera Setup Software* manual for details on commissioning and configuring the camera unit.

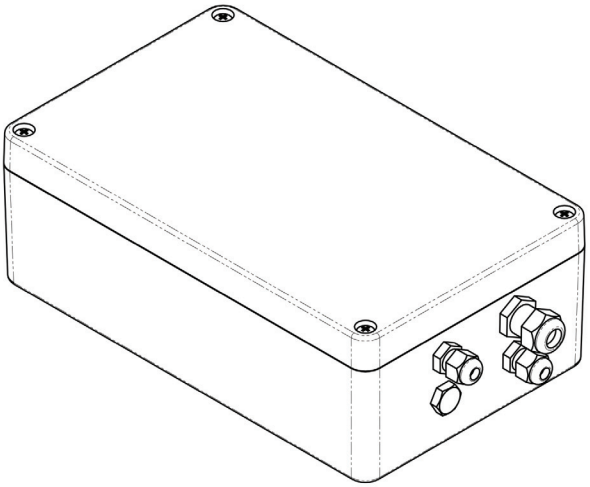
Please check the Bosch Security Systems, Inc. website for the latest user manuals.

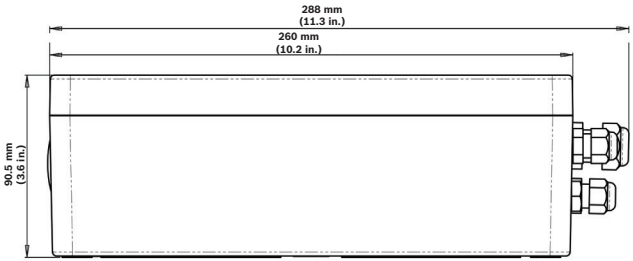
5 Technical Specifications

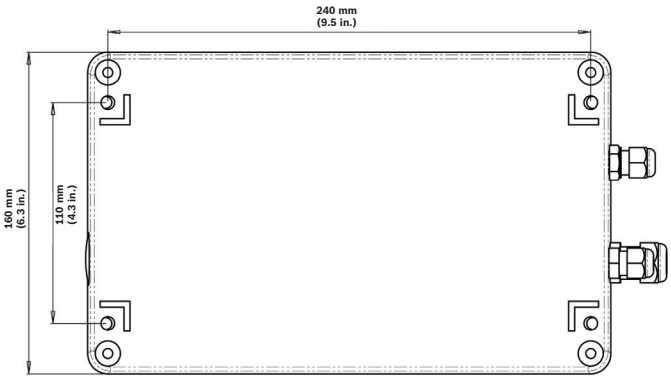
The MIC power supplies are fitted into a cast aluminium IP65 rated enclosure with the following specifications:

MIC PSU	**Voltage**	**Hz**	**Power**	**Output**
MIC-240PSU-UL	230 VAC	50/60 Hz	40 VA	18 VAC
MIC-115PSU-UL	115 VAC	50/60 Hz	40 VA	18 VAC
MIC-24PSU-UL	24 VAC	50/60 Hz	40 VA	18 VAC
MIC-IR-240PSU-UL	230 VAC	50/60 Hz	60 VA	18 VAC
MIC-IR-115PSU-UL	115 VAC	50/60 Hz	60 VA	18 VAC
MIC-IR-24PSU-UL	24 VAC	50/60 Hz	60 VA	18 VAC
All Power Supplies				
Dimensions (H x W x D)	90 x 260 x 160 mm (3.54 x 10.24 x 6.30 in.)			
Weight	3.2 kg (7.1 lb)			

5.1 Dimensional Drawings







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